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Fourth Quarterly Report

to

National Aeronautics and Space Administration

Interactive Initialization of Heat Flux Parameters

for Numerical Models Using

Satellite Temperature Measurements



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I. Introduction

This quarterly report summarizes the progress made in our HCMM research since November 1, 1981. Since the grant was to terminate on March 9, 1982, very little additional analysis work was initiated during the past several months. Work has been geared toward consolidation of past gains, which includes a testing of the interactive minicomputer system, and a start on a paper which will be submitted later this year concerning the analysis of regional-scale soil moisture patterns. Some effort was also devoted to creating an exhibit on remote sensing which was included in the Earth and Mineral Science Exposition (EMEX) sponsored by the school of earth and mineral sciences in April, 1982.

A central feature of this exhibit was a videotape display of various HCMM images, most of which were for the State College area. (We possess the capability of storing all of our satellite imagery on disk or on videotape).

II. Conclusion

Except that we would have wished for time to examine a greater number of images, our original expectations and objectives in the HCMM program were fulfilled. We have developed an interactive image processing and model execution system on minicomputer, which can be used to map patterns of soil moisture, given two or more satellite infrared temperature patterns. We plan to make use of this system in the future using HCMM, TIROS (NOAA), GOES and other types of satellite imagery. There are still many important questions that need to be resolved, concerning the significance, accuracy and limitations of our derived soil moisture patterns. We are still hopeful of obtaining some form of ground truth measurements in upcoming field experiments in order to assess thermal IR method of soil moisture analysis.

We have also continued to remain interested in the urban heat island problem and we are currently engaged in an ongoing effort with Prof. John Lewis of McGill University in analyzing Montreal surface temperature patterns using HCMM data.